



Australasian Pork Research Institute Ltd APRIL

PROJECT SUMMARY

Project Number and Title:

5A-124 Postnatal strategies to increase myofibre proliferation

Project Leader:

Fan Liu, Nutritionist, JBS Pork Australia

Project Participants:

Robyn Warner (The University of Melbourne), Surinder Chauhan (The University of Melbourne) and Frank Dunshea (The University of Melbourne & University of Leeds)

Aims and Objectives:

Lean meat deposition is positively correlated with the total number of myofibers in pigs. Challenging the classical view that myofiber number is fixed by late gestation, some studies have shown that myofiber number increases through the proliferation of tertiary myofibers during the first four weeks after birth, suggesting a novel time window for interventions. N-carbamyl glutamate (NCG) and L-carnitine are the two additives reported to stimulate endogenous growth hormone secretion and thus may promote postnatal myofiber proliferation in young pigs. The experiment aimed to investigate whether oral drenching with NCG or L-carnitine during the suckling phase can increase total myofibre number and thereby improve finisher-phase growth performance.

Key Findings:

Results showed that 21-day oral drenching with NCG (250 mg/day) and L-carnitine (400 mg/d) increased plasma amino acid concentrations but did not affect IGF-1 concentration. The total number of myofibers measured in the loin sample post-slaughter was not affected by the oral drench treatment. The lifetime growth performance and carcass traits were not affected by the oral drench treatment. Born-light pigs had a similar total myofiber number as the born-normal piglets, but the born-light pigs had a poorer average daily intake and growth rate.

Applications to Industry:

The study demonstrated that oral administration of NCG or L-carnitine in the first three weeks after birth is ineffective in improving postnatal myofiber proliferation or lifetime growth performance. Pigs born light are not disadvantaged in terms of total myofiber number. Other physiological factors that dictate the poor growth performance of born-light piglets need to be investigated.